

WHAT IS CLAIMED IS:

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1. A data processing apparatus which can perform data communication with various devices connected on a predetermined communication medium, comprising:

5 acquisition means for acquiring a resource information structure and a status of each device by communicating with the various devices;

10 management means for storing and managing the resource information structure and the status acquired by said acquisition means; and

15 virtual system configuration display means for causing a display unit to display a system configuration based on the resource information structure and the status stored and managed by said management means, such that icons capable of being discriminated for respective functions are displayed to be connected on a virtual network path.

20 2. An apparatus according to Claim 1, wherein the icon for each function is a specific icon which is allocated to a maker of each device and of which displaying form is different from others.

25 3. An apparatus according to Claim 1, further comprising:

 first indication means for indicating an arbitrary combination of the icons for the respective functions

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displayed on the display unit; and

first judgment means for judging effectiveness of
an arbitrary combination function indicated by said
first indication means,

5 wherein, when it is judged by said first judgment
means that the combination function is effective, said
virtual system configuration display means temporarily
changes a display status of the icon for each function
indicated by said first indication means from display
10 statuses of other icons while the combination function
is being executed.

4. An apparatus according to Claim 1, further
comprising:

15 first indication means for indicating an arbitrary
combination of the icons for the respective functions
displayed on the display unit,

wherein said virtual system configuration display
means displays a path to connect shortest the icons for
20 the respective functions indicated by said first
indication means on the virtual network path in a
displaying form different from a displaying form of
other paths.

25 5. An apparatus according to Claim 4, wherein,
when said virtual system configuration display means
displays the path to connect shortest the icons for the

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respective functions indicated by said first indication
means on the virtual network path in the displaying
form different from that of other paths, said virtual
system configuration display means adds a specific
5 emphasis pattern to the indicated icons to emphasize
and display these icons.

6. An apparatus according to Claim 1, wherein the
various devices include at least any of a printer, a
10 fax machine, a digital copying machine, a scanner, a
digital camera and a modem.

7. An apparatus according to Claim 1, wherein
said data processing apparatus can communicate with
15 other data processing apparatus functioning as a
management server.

8. An apparatus according to Claim 7, wherein
said other data processing apparatus updatably stores
20 resources for displaying the resource information
structure acquired from the various device and the
status of each device.

9. An apparatus according to Claim 1, wherein
25 said acquirement means acquires the resource
information structure from a device driver of each
device.

10. An apparatus according to Claim 1, wherein the resource information structure is described based on a predetermined data structure.

5 11. An apparatus according to Claim 8, wherein the resources include various icon image data for displaying the system configuration.

10 12. An apparatus according to Claim 1, further comprising judgment means for judging whether or not each device is shared on a network and a driver has been installed in said data processing apparatus, wherein a displaying form of the icon corresponding to the device of which driver is not
15 installed in said data processing apparatus is made different from a displaying form of the icon of other device in accordance with the judged result of said judgment means.

20 13. An apparatus according to Claim 12, wherein the icon corresponding to the device of which driver is not installed in said data processing apparatus is displayed in gray.

25 14. A data processing method in a data processing apparatus which can perform data communication with various devices connected on a predetermined

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communication medium, said method comprising:

an acquirement step of acquiring a resource information structure and a status of each device by communicating with the various devices;

5 a management step of storing and managing the resource information structure and the status acquired in said acquirement step; and

10 a virtual system configuration display step of causing a display unit to display a system configuration based on the resource information structure and the status stored and managed in said management step, such that icons capable of being discriminated for respective functions are displayed to be connected on a virtual network path.

15 15. A method according to Claim 14, wherein the icon for each function is a specific icon which is allocated to a maker of each device and of which displaying form is different from others.

20 16. A method according to Claim 14, further comprising:

25 a first indication step of indicating an arbitrary combination of the icons for the respective functions displayed on the display unit; and

a first judgment step of judging effectiveness of an arbitrary combination function indicated in said

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first indication step,

wherein, when it is judged in said first judgment step that the combination function is effective, said virtual system configuration display step temporarily changes a display status of the icon for each function indicated in said first indication step from display statuses of other icons while the combination function is being executed.

17. A method according to Claim 14, further comprising:

a first indication step of indicating an arbitrary combination of the icons for the respective functions displayed on the display unit,

wherein said virtual system configuration display step displays a path to connect shortest the icons for the respective functions indicated in said first indication step on the virtual network path in a displaying form different from a displaying form of other paths.

18. A method according to Claim 17, wherein, when said virtual system configuration display step displays the path to connect shortest the icons for the respective functions indicated in said first indication step on the virtual network path in the displaying form different from that of other paths, said virtual system

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configuration display step adds a specific emphasis pattern to the indicated icons to emphasize and display these icons.

5 19. A method according to Claim 14, further comprising a judgment step of judging whether or not each device is shared on a network and a driver has been installed in said data processing apparatus,

10 wherein a displaying form of the icon corresponding to the device of which driver is not installed in said data processing apparatus is made different from a displaying form of the icon of other device in accordance with the judged result in said judgment step.

15 20. A method according to Claim 19, wherein the icon corresponding to the device of which driver is not installed in said data processing apparatus is displayed in gray.

20 21. A storage medium which stores a computer-readable program to control a data processing apparatus capable of performing data communication with various devices connected on a predetermined communication medium, said program comprising:

25 an acquirement step of acquiring a resource information structure and a status of each device by

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communicating with the various devices;

a management step of storing and managing the resource information structure and the status acquired in said acquirement step; and

5 a virtual system configuration display step of causing a display unit to display a system configuration based on the resource information structure and the status stored and managed in said management step, such that icons capable of being
10 discriminated for respective functions are displayed to be connected on a virtual network path.

22. A storage medium according to Claim 21, wherein the icon for each function is a specific icon
15 which is allocated to a maker of each device and of which displaying form is different from others.

23. A storage medium according to Claim 21, wherein said program further comprises:

20 a first indication step of indicating an arbitrary combination of the icons for the respective functions displayed on the display unit; and

a first judgment step of judging effectiveness of an arbitrary combination function indicated in said
25 first indication step,

wherein, when it is judged in said first judgment step that the combination function is effective, said

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virtual system configuration display step temporarily
changes a display status of the icon for each function
indicated in said first indication step from display
statuses of other icons while the combination function
5 is being executed.

24. A storage medium according to Claim 21,
wherein said program further comprises:

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10 a first indication step of indicating an arbitrary
combination of the icons for the respective functions
displayed on the display unit,

wherein said virtual system configuration display
step displays a path to connect shortest the icons for
the respective functions indicated in said first
15 indication step on the virtual network path in a
displaying form different from a displaying form of
other paths.

25. A storage medium according to Claim 24,
20 wherein, when said virtual system configuration display
step displays the path to connect shortest the icons
for the respective functions indicated in said first
indication step on the virtual network path in the
displaying form different from that of other paths,
25 said virtual system configuration display step adds a
specific emphasis pattern to the indicated icons to
emphasize and display these icons.

26. A storage medium according to Claim 21,
wherein said program further comprises a judgment step
of judging whether or not each device is shared on a
network and a driver has been installed in said data
5 processing apparatus, and

wherein a displaying form of the icon
corresponding to the device of which driver is not
installed in said data processing apparatus is made
different from a displaying form of the icon of other
10 device in accordance with the judged result in said
judgment step.

27. A storage medium according to Claim 26,
wherein the icon corresponding to the device of which
15 driver is not installed in said data processing
apparatus is displayed in gray.

28. A data processing apparatus which can perform
data communication with plural devices connectable with
20 a data communication path, comprising:

display control means for displaying icons
visually representing appearances of the devices
connected on the data communication path, on a display
unit,

25 wherein said display control means displays, on
the display unit, an image representing the data
communication path together with the plural icons

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respectively corresponding to the plural devices, and
said display control means disposes and displays
the icons nearby the image representing the data
communication path according to a connection status of
5 the data communication path and the devices.

29. An apparatus according to Claim 28, wherein
each of the plural devices has at least an independent
function, and said display control means makes a
10 displaying form of the icon different for each function.

30. An apparatus according to Claim 29, wherein,
even if the plural icons respectively represent the
devices having an identical function, said display
15 control means makes the displaying forms of these icons
different from others according to makers different.

31. An apparatus according to Claim 29, wherein
the plural devices include a scanner, a printer and a
20 digital copying machine, and

said display control unit displays the icon
visually representing the appearance of the scanner,
the icon visually representing the appearance of the
printer, and the icon visually representing the
25 appearance of the digital copying machine on the
display unit according as these devices are connected
on the data communication path.

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32. An apparatus according to Claim 31, wherein the plural devices include a fax machine, a digital camera and a modem, and

5 said display control unit displays the icon visually representing the appearance of the fax machine, the icon visually representing the appearance of the digital camera, and the icon visually representing the appearance of the modem on the display unit according as these devices are connected on the
10 data communication path.

33. An apparatus according to Claim 31, further comprising first indication means for indicating an arbitrary combination of the icons from among the
15 plural icons displayed on the display unit,

wherein, according as the combination of the icons corresponding to the scanner and the printer is indicated by said first indication means, the scanner and the printer are cooperated with each other through
20 the data communication path so as to execute a function equivalent to the function executable by the digital copying machine.

34. An apparatus according to Claim 29, further
25 comprising:

first indication means for indicating an arbitrary combination of the icons from among the plural icons

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displayed on the display unit;

judgment means for judging whether or not the combination indicated by said first indication means is appropriate; and

5 control means for cooperating, according to the judged result of said judgment means, each of the devices represented by the icons of the arbitrary combination indicated by said first indication means with others through the data communication path so as
10 to execute an arbitrary combination function executable by the devices represented by the icons of the arbitrary combination.

35. An apparatus according to Claim 34, wherein
15 said display control means temporarily makes the displaying form of the icons of the arbitrary combination indicated by said first indication means different from the displaying form of the icons representing other devices, according as the
20 combination function is executed by using the arbitrary combination function.

36. An apparatus according to Claim 35, wherein
25 said display control means displays a specific emphasis pattern nearby the icon of the arbitrary combination indicated by said first indication means.

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37. An apparatus according to Claim 34, wherein,
according as the combination function is executed by
using the devices represented by the icons of the
arbitrary combination, said display control means makes
the displaying form of an image corresponding to a path
connecting these devices with others on the image
representing the data communication path different from
the displaying form of an image corresponding to other
path.

38. An apparatus according to Claim 34, wherein,
according as the combination function is executed by
using the devices represented by the icons of the
arbitrary combination, said display control means
temporarily makes the displaying form of the icon
corresponding to the arbitrary device indicated by said
first indication means different from the displaying
form of the icon corresponding to other device, and
makes the displaying form of an image corresponding to
a path connecting these devices with others on the
image representing the data communication path
different from the displaying form of an image
corresponding to other path.

39. An apparatus according to Claim 28, wherein,
according as the device of which driver is not
installed in said data processing apparatus is

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connected on the data communication path, said display control means makes a displaying form of the icon corresponding to the device of which driver is not installed different from a displaying form of the icon of other device.

40. An apparatus according to Claim 39, wherein said display control means displays in gray the icon corresponding to the device of which driver is not installed.

41. An apparatus according to Claim 28, further comprising:

acquisition means for acquiring data concerning an operation condition output by the device through the data communication path,

wherein said display control means displays the data concerning the operation condition nearby the icon corresponding to the device of a data output source acquired by said acquisition means.

42. An apparatus according to Claim 28, wherein, according as the device capable of inputting or outputting a color image is connected on the data communication path, said display control means displays a mark indicating such a fact nearby the icon corresponding to the device capable of inputting or

outputting the color image.

43. An apparatus according to Claim 28, wherein,
according as the device of which driver has been
5 installed in said data processing apparatus but which
can not be used is connected on the data communication
path, said display control means displays a mark
indicating such a fact nearby the icon corresponding to
the unusable device.

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44. A data processing method for a data
processing apparatus which can perform data
communication with plural devices connectable with a
data communication path, said method comprising:

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a display control step of displaying icons
visually representing appearances of the devices
connected on the data communication path, on a display unit,

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wherein said display control step displays, on the
display unit, an image representing the data
communication path together with the plural icons
respectively corresponding to the plural devices, and

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said display control step disposes and displays
the icons nearby the image representing the data
communication path according to a connection status of
the data communication path and the devices.

45. A storage medium which stores a program to

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cause a data processing apparatus which can perform data communication with plural devices connectable with a data communication path, to execute following step:

5 a display control step of displaying icons visually representing appearances of the devices connected on the data communication path, on a display unit,

10 wherein said display control step displays, on the display unit, an image representing the data communication path together with the plural icons respectively corresponding to the plural devices, and

15 said display control step disposes and displays the icons nearby the image representing the data communication path according to a connection status of the data communication path and the devices.

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